Supplementary Appendix 1 Effect of Cannabis on Sperm Parameters

Semen Parameter	Results	Conditions	Study
Count/Concentration	Decreased sperm count and concentration	Male rats, 16 puffs of marijuana per day for 75 days	Huang et al.[9]
	Decreased sperm concentration	3-6 mg/kg of bhang administered to mice for 36 days	Banerjee et al.[10]
	Complete arrest of spermatogenesis	12.5 mg/kg of cannabis administered to dogs daily for 30 days	Dixit et al.[11]
	Users smoking 10 or more times per week had lower sperm count than men smoking 5-9 marijuana cigarettes per week	20 chronic marijuana users smoking at least four days a week for six months	Kolodny et al.[12]
	Men using marijuana more than once per week had lower sperm count and concentration versus controls	1,215 Danish men who report using marijuana more than once per week	Gundersen et al.[13]
	Decreased sperm count and concentration observed at 5 and 6 weeks	16 chronic marijuana smokers using marijuana for four weeks	Hembree et al.[14]
Morphology	THC and CBN treated mice had higher incidence of abnormal morphology versus controls	Male mice given 5 consecutive days of THC, CBD, or CBN injections for 35 days	Zimmerman et al.[15]
	Increased detachment of sperm heads and tails	Male rats, 16 puffs of marijuana per day for 75 days	Huang et al.[9]
	More likely to have abnormal sperm morphology than non-cannabis user controls	1700 men presenting at fertility clinics in the UK who used cannabis in the last three months	Pacey et al.[16]
	No increase in fetal dominant-lethal mutations or heritable translocations over controls in fetuses fathered by mice dosed with THC	498 male mice dosed with 50 mg/kg of THC 5 times a week for 6 weeks, mated with female mice	Generosos et al.[17]
	No increase in preimplantation fetal loss, fetal mortality, or mutation index in fetuses fathered by mice dosed with THC	10 mice given 10mg/kg of THC in sesame oil once every 2 days for 5 weeks, mated with female mice	Berryman et al.[18]

Motility	Reduced motility	Human sperm incubated with THC for 3 hours	Whan et al.[19]
	Reduced motility	Semen samples from 16 chronic marijuana smokers using marijuana for four weeks	Hembree et al.[14]
Viability	Viability decreased in a dose-dependent manner at supraphysiologic concentrations	Human sperm incubated with AEA	Rossato et al.[22]
	Viability increased with CB1 receptor antagonist rimonabant	Human sperm incubated with rimonabant, a CB1 receptor antagonist	Cobellis et al.[23]
	1nM and 10nM rimonabant increased viability, with no additional effects at higher concentrations	Human sperm incubated with 1nM, 10nM, 100nM, and 1 μM concentrations of rimonabant	Aquila et al.[4]
	Capacitation-induced acrosome reaction inhibited	Human sperm incubated with a capacitating medium and AEA	Rossatto et al.[22]
	Sperm capacitation reduced in a time dependent manner with Met-AEA. No effect on capacitation when rimonabant is added	Boar sperm incubated with Met-AEA, and Met-AEA + rimonabant	Maccarone et al.[26]
	Concentration dependent stimulation and inhibition of hyperactivated motility, inhibited acrosomal modifications, decreased tight binding to zona pellucida	Human sperm incubated with AM-365, a cannabinoid agonist	Schuel et al.[25]
	Inhibition of acrosome reaction	Human sperm undergoing artificial induction of acrosome reaction, incubated with THC	Whan et al.[19]